

Appl. No. 10/643,394  
Reply to Office Action of May 11, 2005

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1. **(Currently Amended)** An ink-jet recording sheet comprising;  
a support; and  
a porous layer including fine particles and a binder  
containing a polymer compound crosslinked through side chains of  
the polymer on the support,  
wherein the crosslinked polymer compound is formed the  
crosslink by irradiating ionizing radiation to a hydrophilic  
polymer compound which has a polymerization degree of not less  
than 300 and a plurality of side chains on a main chain of the  
hydrophilic polymer compound, and  
wherein a weight ratio of the fine particles to the binder  
in the porous layer is from 2:1 to 50:1.

**Claim 2 (Canceled).**

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**3. (Original)** The ink jet recording sheet of claim 1, wherein the weight ratio of the fine particles to the binder in the porous layer is from 6 : 1 to 15 : 1.

**4. (Original)** The ink jet recording sheet of claim 1, wherein the porous layer includes a multivalent metal compound.

**5. (Original)** The ink jet recording sheet of claim 1, wherein a diameter of fine particles is from 0.005 to 0.4  $\mu\text{m}$ .

**6. (Original)** The ink-jet recording sheet of claim 1, wherein the hydrophilic polymer compound has a photosensitive group capable of dimerization by the ionizing radiation, on the side chains.

**7. (Withdrawn-Currently Amended)** A producing method of [[an]] the ink-jet recording sheet of claim 1 comprising steps of:  
providing on a support a layer including fine particles and a binder containing hydrophilic polymer compound which has plural

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side chains on a main chain thereof and a polymerization degree of not less than 300; and

irradiating ionized radiation to the polymer compound to form crosslinking through the side chains to form a porous layer.

8. (Withdrawn) The producing method of an ink-jet recording sheet of claim 7, wherein a weight ratio of the fine particles to the binder containing the polymer compound formed by the crosslinking through the side chains is from 2 : 1 to 50 : 1.

9. (Withdrawn) The producing method of an ink-jet recording sheet of claim 7, wherein a weight ratio of the fine particles to the binder containing the polymer compound formed by the crosslinking through the side chains is from 6 : 1 to 15 : 1.

10. (Withdrawn) The producing method of an ink-jet recording sheet of claim 7, wherein the porous layer includes a multivalent metal compound.

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11. **(Withdrawn)** The producing method of an ink-jet recording sheet of claim 7, wherein a diameter of the fine particles is from 0.005  $\mu\text{m}$  to 0.4  $\mu\text{m}$ .

12. **(Withdrawn)** The producing method of an ink-jet recording sheet of claim 7, wherein the hydrophilic polymer compound has a photosensitive group capable of dimerization by the ionizing radiation, on the side chains.

13. **(Withdrawn)** The producing method of an ink-jet recording sheet of claim 7, wherein the porous layer is formed by coating a coating composition comprising the fine particles and the hydrophilic polymer compound which has plural side chains on the main chain thereof and a polymerization degree of not less than 300, and irradiating an ionizing radiation to the polymer compound in the coated layer to form the crosslink between the side chains.

14. **(Withdrawn)** The producing method of an ink-jet recording sheet of claim 13, wherein the irradiation of the ionizing

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radiation is applied at a time in which the weight ratio of solvent to the solid component in the coated layer is not less than 100%.

15. (Withdrawn) The producing method of an ink-jet recording sheet of claim 13, wherein the polymer compound in the coated layer is irradiated the ionizing radiation so that the elastic modulus of the coated layer after the irradiation is not less than 1.5 times of that of the coated layer before the irradiation and the viscosity coefficient of the coated layer after the irradiation is not less than 1.5 times of that of the coated layer before the irradiation.

16. (Withdrawn) The producing method of an ink-jet recording sheet of claim 14, wherein the irradiation of the ionizing radiation is further applied at a time in which the weight ratio of solvent to the solid component in the coated layer is less than 100%.

17. (Withdrawn) The producing method of an ink-jet recording sheet of claim 13, wherein the coated layer is dried after the

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irradiation, in atmosphere at a temperature higher not less than 10 °C than that before the irradiation.

**18. (Withdrawn)** The producing method of an ink-jet recording sheet of claim 13, wherein after the coated layer is dried, the coated layer is stood for not less than 24 hours in atmosphere at a temperature of not less than 30 °C.

**19. (Withdrawn)** The producing method of an ink-jet recording sheet of claim 7, wherein the ionizing radiation is ultraviolet ray.